

PHYSICAL REALITIES FROM SIMPLE PHILOSOPHICAL CONJECTURES.

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ABSTRACT. We will focus on the Quantum theory and starting from simple philosophical conjectures, we infer possible different physical realities. Also we argue of possible wavefunction emerging under specific conditions of the physical reality. Finally, we affirm that the "hidden choice" of the ontic elements as primitive is a fundamental step to analyze the construction of any theory.

1. THREE BASIC ELEMENTS.

We work with three basic elements:

- (1) The observer.
- (2) The law of physics.
- (3) Physical Phenomenon.

We assume that physical reality and physical phenomenon are different concepts, latter is subjects of observation. Above three elements and quantum theory will be used to infer possible underlying physical realities.

Premise:

- symbol: **1** mean an **ontic** element
- symbol: **0** mean an **epistemic** element
- the choice of symbol "1" mean that the correspondent element is take as primitive.

This **classical** table summarize possible realities:

Observer	Law Phys.	Phen.	Physical Realities
0	0	0	<i>No reality</i>
0	0	1	<i>Realism/Emperic.</i>
0	1	0	<i>Platonism (e.g. Rovelli[1]/Everett Inter.)</i>
0	1	1	<i>Weak Realism</i>
1	0	0	<i>Idealism (e.g. Fuchs[2] Inter.)</i>
1	0	1	<i>Mind/Matter Int.</i>
1	1	0	<i>Weak Idealism</i>
1	1	1	<i>Monism (i.e. Anomalous Monism[3])</i>

Observation: The hidden choice of the primitive element is fundamental to determine the underlying reality. Now, the problem is to establish if: (i) the "choice" is a **consequence** of theory, a consequence of his experimental data or (ii) an **"a**

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priori” hidden choice. We argue, that we can find in the **premise** of any theory the questions/answers and their consequence, in other words, we have the start/end in the premise. In order to justify these strong and debated statements, we can see (above table), that starting from different ontic elements, related to the same phenomenon (e.g. measurement process in quantum theory) we have two different interpretations of **underlying physical reality**.

For instance, the **first** case:

- (1) The observer is the **ontic** element
- (2) The law of physics are secondary
- (3) Physical Phenomenon is secondary

The consequences of the measurement process are:

- (1) ”Measurement” is only an information of the observer.
- (2) The physical reality do not exist.
- (3) Physical Phenomenon is provoked by observer.

For instance, a **second** case:

- (1) Physical Phenomenon is ontic.
- (2) The observer is a secondary property.
- (3) The law of physics are secondary.

The consequences related to measurement process are:

- (1) Physical Phenomenon is the only objective elements.
- (2) The observer is a reduction of the phenomenon, they have the same properties.
- (3) Instrumentalist interpretation of the physical’s laws.

As we can see, the conclusions on the conception of reality are completely different.

2. WAVEFUNCTION INFERRED.

We conclude the brief paper, with another table, now we include in the table as variable ontic/epistemic the physical reality in order to infer the correspondent quantum mechanics theory (i.e. wavefunction). In this case we try to give an **”a priori”** possible nature of physical reality.

Observer	Phys.Real.	Phen.	wavefunction $ \Psi\rangle$ of
0	0	0	$ \Psi\rangle$ <i>unknown interpretation</i>
0	0	1	$ \Psi\rangle$ <i>(e.g. GRW inter.)</i>
0	1	0	$ \Psi\rangle$ <i>(e.g. Rovelli inter.)</i>
0	1	1	$ \Psi\rangle$ <i>(e.g. Bohm inter.)</i>
1	0	0	$ \Psi\rangle$ <i>(e.g. Copenhagen, Fuchs-Zeilinger inter.)</i>
1	0	1	$ \Psi\rangle$ <i>(e.g. Informational inter.)</i>
1	1	0	$ \Psi\rangle$ <i>unknown interpretation</i>
1	1	1	$ \Psi\rangle$ <i>unknown interpretation</i>

3. CONCLUSION.

Simple and intuitive conjectures from philosophical point of view, maybe help us to clear the "entangled" world of the interpretations of QM. The "a priori" choice of the ontic elements remain a fundamental step to interpret and analyze not only quantum theory.

REFERENCES

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